PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

COZENS, P.
MATHYS & SQUIRE
100 Gray's Inn Road
London WC1X 8AL
GRANDE BRETAGNE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

	Date of mailing *(day/month/year)* 20.01.2000
Applicant's or agent's file reference PDC/AB/20402	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB99/00850	29/04/1999	29/04/1998

Applicant
CANAL+ SOCIETE ANONYME et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Corcos. E Tel.+49 89 2399-7418

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PDC/AB/20402		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB99/00850	29/04/1999	29/04/1998
International Patent Classification (IPC) or national classification and IPC		
H04N5/445		
Applicant		
CANAL+ SOCIETE ANONYME et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
04/11/1999	20.01.2000
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Glendinning. D Telephone No. +49 89 2399 2443

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB99/00850

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-20 as originally filed

Claims, No.:

1-22 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:

☐ the claims, Nos.:

☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 20,21,22.

because:

☒ the said international application, or the said claims Nos. 20,21,22 relate to the following subject matter which does not require an international preliminary examination (*specify*):

see separate sheet

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-19
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-19
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

III Non-establishment of report

No report has been established in respect of claims 20, 21 and 22 since these claims are in a form not permissible under the PCT (see section VII below).

V Reasoned statement under Article 35(2)

Independent claims 1 and 11 define a method and apparatus employing a memory having a data buffer area for storing incoming data for display and a graphics buffer area for storing graphics data, wherein graphics data is transferred from the graphics buffer area to the data buffer area for combination with the display data stored therein. All of the documents cited in the Search Report, including the documents cited in the X and Y categories, appear to relate to systems including separate buffers or memories for incoming data and graphics, information being read from the respective buffers or memories at appropriate times for onward feeding to a display. No combination of the cited documents would appear to suggest storing incoming data and graphics data in separate buffers of a memory and then transferring graphics data from one buffer to the other for combination with the display data. The claimed subject matter thus appears to be new and to have inventive step.

VII Certain defects in the international application

Claims 20, 21 and 22 are in a form not permitted by Rule 6.2(a) PCT and should accordingly be deleted.

Canal+ Technologies Societe Anonyme
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France

1 February 2000

International Patent Application No. PCT/IB99/00850
"Subtitling Device"

FR 3232 9211 734

PDC/20402

To: Reporting publication and forwarding a copy of the published application to you; reviewing International Preliminary Examination Report and reporting to you.

ASB 0.5 hrs @ £140.00/hr = £70.00
PDC 0.25 hrs @ £220.00/hr = £55.00
Service = £108.00

£233.00

TO BE PAID BY QUARTERLY PAYMENT SYSTEM 2000

£233.00

£233.00 £ Sterling

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION** see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
PDC/AB/20402		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/IB 99/00850	29/04/1999	29/04/1998
Applicant		
CANAL+ SOCIETE ANONYME et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 4

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00850

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N5/445 G09G1/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G09G H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 5 559 549 A (BONNER ALFRED E ET AL) 24 September 1996 (1996-09-24) column 6, line 23 - line 26 column 8, line 15 - line 16 column 10, line 48 - column 11, line 34 column 13, line 1 - line 7 column 18, line 11 - line 27 column 18, line 48 - column 19, line 47 column 24, line 7 - column 26, line 7 figures 9A,B,C --- -/--	1,5-11, 16-22 2-4, 12-15

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 September 1999	15/09/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	La, V

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X Y A	EP 0 752 695 A (SUN MICROSYSTEMS INC) 8 January 1997 (1997-01-08) page 2, line 3 - line 25 page 3, line 4 - line 29 page 5, line 28 - line 54 page 6, line 47 - page 7, line 4 abstract; figure 2	1,5,11, 16,19-22 2-4, 12-15 6-10,17, 18
Y A	US 4 862 154 A (GONZALEZ-LOPEZ JORGE) 29 August 1989 (1989-08-29) column 1, line 7 - line 12 column 2, line 46 - line 55 column 3, line 1 - line 9 column 4, line 15 - line 29 abstract; figure 7	2-4, 12-15 1,5-11, 16-22
X A	EP 0 575 149 A (HONEYWELL INC) 22 December 1993 (1993-12-22) column 1, line 28 - line 33 column 2, line 57 - column 3, line 59 column 6, line 22 - line 33 abstract; figure 3	1,11, 19-22 2-10, 12-18
A	EP 0 802 519 A (SEIKO EPSON CORP) 22 October 1997 (1997-10-22) page 2, line 20 - line 21 page 4, line 45 - line 56 page 6, line 31 - line 33 page 12, line 17 - page 15, line 29 page 16, line 13 - line 21 abstract; figures 20,21	1-22
A	US 5 594 467 A (MARLTON ANTHONY P ET AL) 14 January 1997 (1997-01-14) column 1, line 56 - line 67 column 3, line 22 - line 28 column 3, line 53 - column 4, line 16 column 25, line 21 - line 57 abstract	1-22
A	EP 0 384 257 A (IBM) 29 August 1990 (1990-08-29) column 1, line 4 - line 13 column 1, line 53 - column 2, line 6 column 3, line 24 - line 30 column 5, line 34 - column 7, line 20 column 14, line 8 - line 13 abstract; figures 1-3	1-22

-/--

1

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00850

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 484 981 A (FUJI PHOTO FILM CO LTD) 13 May 1992 (1992-05-13) column 1, line 5 - line 10 column 5, line 30 - column 6, line 36 column 21, line 38 - column 23, line 47 column 24, line 4 - line 5 column 28, line 40 - column 29, line 37 abstract; figures 1,2	1-22
A	EP 0 766 463 A (TOKYO SHIBAURA ELECTRIC CO) 2 April 1997 (1997-04-02) abstract	1-22

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/IB 99/00850

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5559549 A	24-09-1996	AT 177277 T	15-03-1999
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		AT 176841 T	15-03-1999
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		JP 9237073 A	09-09-1997
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		JP 63121890 A	25-05-1988
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/IB 99/00850

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		DE 69129730 T	12-11-1998
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		CN 1152839 A	25-06-1997
		US 5734436 A	31-03-1998

526 Rec'd PCT/PTO 25 OCT 2000

RECEIVER/DECODER AND METHOD OF PROCESSING VIDEO DATA

The present invention relates to a receiver/decoder and a method of processing video data.

The term "receiver/decoder" used herein may connote a receiver for receiving either encoded or non-encoded signals, for example, television and/or radio signals, which may be broadcast or transmitted by some other means. The term may also connote a decoder for decoding received signals. Embodiments of such receiver/decoders may include a decoder integral with the receiver for decoding the received signals, for example, in a "set-top box", such a decoder functioning in combination with a physically separate receiver, or such a decoder including additional functions, such as a web browser, a video recorder, or a television.

In a broadcast digital television system, received signals are passed to a receiver/decoder and thence to a television set. As used herein, the term "digital television system" includes for example any satellite, terrestrial, cable and other system. The receiver/decoder decodes a compressed MPEG-type signal into a television signal for the television set. It is controlled by a remote controller handset, through an interface in the receiver/decoder. The receiver/decoder is used to process the incoming bit stream, and includes a variety of application modules which cause the receiver/decoder to perform a variety of control and other functions.

Such a receiver/decoder may have a variety of devices coupled to it, such as a card reader for the user to pass an authorization card through to confirm which services the user is authorized to use, a hand-held television receiver control wand, a television display unit, and a second card reader for use with bank cards to allow the user to perform home banking functions. It may also have a variety of ports coupled to it, for example, a modem for access to the Internet and for conducting home

banking transactions.

The receiver/decoder typically includes a buffering arrangement for handling incoming data. The basic principle of buffering in a receiver/decoder is that a memory section in a memory is designated as a buffer. Incoming data from a port is fed into the buffer. The buffer size may be chosen to be large enough to accommodate most or all incoming messages, or the buffer may be operated with two pointers, one for the point where fresh incoming data is written into the buffer and the other for the point where stored data is read from the buffer.

The receiver/decoder normally includes a 4-layer structure for generating the image to be displayed on the television set, the 4 layers being a stills layer, a moving image layer, a graphics layer, and a cursor layer. The graphics layer is preferably utilized for both icons (typically geometric shapes) and titles (usually but not always subtitles). The use of a common layer, the graphics layer, for both icons and titles causes difficulties in maintaining and updating both the icons and the titles satisfactorily, particularly as a title can appear at any position on the screen.

The main aim of the present invention is to provide an improved buffering arrangement in a receiver/decoder to solve this and other problems.

The present invention provides a method of processing video data in a receiver/decoder comprising at least one port for receiving data and memory means comprising a data buffer area for storing incoming data for display, and a graphics buffer area for storing graphics data, said method comprising passing graphics data stored in the graphics buffer area to the data buffer area for combination with display data stored therein.

In a preferred embodiment, the incoming data comprises video text data, such as one or more subtitles, and the graphics data comprises icon data. When a subtitle screen

has been fully received in the data buffer area, a central processing unit in the receiver/decoder, under the control of a device, passes icon data into the data buffer area, preferably just before the data stored in the data buffer area is combined with other data to provide video data. Hence, the invention affords the advantage that in the event of an overlap between the icon and part of the subtitle, the icon can be laid over that part of the subtitle, but the non-overlapped parts can be concurrently displayed with the icon.

In a preferred embodiment, the data buffer area comprises two data buffer sub-areas, said incoming display data being directed into one of said sub-areas at a time.

The two sub-areas may be interchanged so that further incoming display data is stored in the other sub-area and graphics data stored in the graphics buffer area is passed to the other sub-area. This can enable a subtitle screen to be stored in one sub-area whilst a previously received subtitle screen is being output from another sub-area, thereby avoiding over-writing of the previously received subtitle screen with fresh data.

Preferably, the two sub-areas are interchanged immediately after graphics data stored in the graphics buffer area is passed to one of the data buffer sub-areas.

The graphics buffer area may comprise a plurality of graphics buffer sub-areas in which graphics data can be stored, graphics data being passed to the data buffer area from a selected one of the graphics buffer sub-areas. This can enable, for example, a number of different icons to be generated and stored prior to the reception of any video text data, so that there is no need for icon generating means to generate continuously icon data.

Preferably, the combined graphics and display data is further combined with other received data to provide video data. Thus, whilst further incoming display data is

being stored in one data buffer sub-area and graphics data stored in the graphics buffer area is being passed to that data buffer sub-area, the combined data of the other data buffer sub-area can be further combined with the other received data, again thereby avoiding over-writing of the previously received subtitle screen with fresh data.

Preferably, graphics data stored in the graphics buffer area is passed into the data buffer area for combination with display data stored therein immediately before the thus combined graphics and display data is combined with said other received data.

The video data may comprise four layers of data, said combined graphics and display data comprising one of said layers. If so, the four layers of data may comprise said combined graphics and display data layer, a stills data layer, a moving image data layer, and a cursor data layer.

The moving image data layer and the display data may comprise at least part of an MPEG datastream.

The present invention also provides a receiver/decoder comprising at least one port for receiving data, memory means comprising a data buffer area for storing incoming data for display and a graphics buffer area for storing graphics data, and means for passing graphics data stored in the graphics buffer area to the data buffer area for combination with display data stored therein.

A preferred embodiment of the receiver/decoder comprises at least one port for receiving data, a memory comprising a data buffer area for storing incoming data for display and a graphics buffer area for storing graphics data, and a processor for passing graphics data stored in the graphics buffer area to the data buffer area for combination with display data stored therein.

The data buffer area may comprise two data buffer sub-areas, and the receiver/decoder may further comprise means, for example, a microprocessor, for directing incoming data into one of said sub-areas.

The receiver/decoder may further comprise control means, such as, for example, a device, the directing means being arranged to direct incoming display data to one of the data buffer sub-areas as specified by said control means.

The receiver/decoder may further comprise means, for example, a device, for interchanging the two sub-areas so that further incoming display data is storable in the other sub-area and graphics data stored in the graphics buffer area is passable to the other sub-area.

The interchanging means may be adapted to interchange the two data buffer sub-areas immediately after graphics data stored in the graphics buffer area is passed to one of the data buffer sub-areas.

The graphics buffer area may comprise a plurality of graphics buffer sub-areas in which graphics data is storable, graphics data being passable to the data buffer area from a selected one of the graphics buffer sub-areas.

The receiver/decoder may further comprise means for combining the combined graphics and display data with other received data to provide video data. IN one preferred embodiment, the combining means is a mixing circuit.

The passing means may be arranged to pass graphics data stored in the graphics buffer area into the data buffer area for combination with display data stored therein immediately before combining means combines the combined graphics and display data with said other received data.

The receiver/decoder may further comprise buffer control means, such as, for example, a device, the data buffer sub-areas being defined by the buffer control means.

The present invention also extends to a broadcast and reception system including a receiver/decoder as aforementioned, and means for broadcasting said data. In a preferred embodiment, the system is a digital television system.

Various functions of the receiver/decoder may be implemented in hardware, for example in a dedicated integrated circuit; this may provide enhanced speed of operation. Preferably, however, at least some of the functions are implemented in software, preferably implemented by processing means which runs the applications; this can allow greater flexibility, require less components, and allow the receiver/decoder to be updated more readily.

Receiver/decoders embodying the invention will now be described, by way of example, with reference to the drawings, in which:

Figure 1 is a schematic diagram of a digital television system;

Figure 2 is a schematic diagram of the structure of a receiver/decoder of the system of Figure 1;

Figure 3 is a functional block diagram of the layered architecture of the receiver/decoder;

Figure 4 is a schematic diagram of the arrangement of the graphic processor of the receiver/decoder;

Figure 5 is a schematic diagram of a RAM memory of the graphic processor; and

Figure 6 is a schematic diagram illustrating the combination of layers of a video display.

An overview of a digital television system 1 is shown in Figure 1. The invention includes a mostly conventional digital television system 2 that uses the known MPEG-2 compression system to transmit compressed digital signals. In more detail, MPEG-2 compressor 3 in a broadcast centre receives a digital signal stream (typically a stream of video signals). The compressor 3 is connected to a multiplexer and scrambler 4 by linkage 5.

The multiplexer 4 receives a plurality of further input signals, assembles the transport stream and transmits compressed digital signals to a transmitter 6 of the broadcast centre via linkage 7, which can of course take a wide variety of forms including telecommunications links. The transmitter 6 transmits electromagnetic signals via uplink 8 towards a satellite transponder 9, where they are electronically processed and broadcast via notional downlink 10 to earth receiver 12, conventionally in the form of a dish owned or rented by the end user. The signals received by receiver 12 are transmitted to an integrated receiver/decoder 13 owned or rented by the end user and connected to the end user's television set 14. The receiver/decoder 13 decodes the compressed MPEG-2 signal into a television signal for the television set 14.

Other transport channels for transmission of the data are of course possible, such as terrestrial broadcast, cable transmission, combined satellite/cable links, telephone networks etc.

In a multichannel system, the multiplexer 4 handles audio and video information received from a number of parallel sources and interacts with the transmitter 6 to broadcast the information along a corresponding number of channels. In addition to audiovisual information, messages or applications or any other sort of digital data may be introduced in some or all of these channels interlaced with the transmitted

digital audio and video information.

A conditional access system 15 is connected to the multiplexer 4 and the receiver/decoder 13, and is located partly in the broadcast centre and partly in the decoder. It enables the end user to access digital television broadcasts from one or more broadcast suppliers. A smartcard, capable of deciphering messages relating to commercial offers (that is, one or several television programmes sold by the broadcast supplier), can be inserted into the receiver/decoder 13. Using the decoder 13 and smartcard, the end user may purchase commercial offers in either a subscription mode or a pay-per-view mode.

As mentioned above, programmes transmitted by the system are scrambled at the multiplexer 4, the conditions and encryption keys applied to a given transmission being determined by the access control system 15. Transmission of scrambled data in this way is well known in the field of pay TV systems. Typically, scrambled data is transmitted together with a control word for descrambling of the data, the control word itself being encrypted by a so-called exploitation key and transmitted in encrypted form.

The scrambled data and encrypted control word are then received by the decoder 13 having access to an equivalent to the exploitation key stored on a smart card inserted in the decoder to decrypt the encrypted control word and thereafter descramble the transmitted data. A paid-up subscriber will receive, for example, in a broadcast monthly ECM (Entitlement Control Message) the exploitation key necessary to decrypt the encrypted control word so as to permit viewing of the transmission.

An interactive system 16, also connected to the multiplexer 4 and the receiver/decoder 13 and again located partly in the broadcast centre and partly in the decoder, enables the end user to interact with various applications via a modern back channel 17. The modem back channel may also be used for communications used in

the conditional access system 15. An interactive system may be used, for example, to enable the viewer to communicate immediately with the transmission centre to demand authorisation to watch a particular event, download an application etc.

Referring to Figure 2, the elements of the receiver/decoder 13 or set-top box will now be described. The elements shown in this figure will be described in terms of functional blocks.

The decoder 13 comprises a central processor 20 including associated memory elements and adapted to receive input data from a serial interface 21, a parallel interface 22, a modem 23 (connected to the modem back channel 17 of Fig. 1), and switch contacts 24 on the front panel of the decoder.

The decoder is additionally adapted to receive inputs from an infra-red remote control 25 via a control unit 26 and also possesses two smartcard readers 27, 28 adapted to read bank or subscription smartcards 29, 30 respectively. The subscription smartcard reader 28 engages with an inserted subscription card 30 and with a conditional access unit 29 to supply the necessary control word to a demultiplexer/descrambler 30 to enable the encrypted broadcast signal to be descrambled. The decoder also includes a conventional tuner 31 and demodulator 32 to receive and demodulate the satellite transmission before being filtered and demultiplexed by the unit 30.

Processing of data within the decoder is generally handled by the central processor 20. Figure 3 illustrates the software architecture of the central processor 20 of the receiver/decoder. With reference to Figure 3, the software architecture comprises a Run-Time-Engine 4008, a Device Manager 4068 and a plurality of Devices 4062 and Device Drivers 4066 for running one or more applications 4056.

As used in this description, an application is a piece of computer code for controlling high level functions of preferably the receiver/decoder 13. For example, when the

end user positions the focus of remote control 25 on a button object seen on the screen of the television set 14 and presses a validation key, the instruction sequence associated with the button is run.

An interactive application proposes menus and executes commands at the request of the end user and provides data related to the purpose of the application. Applications may be either resident applications, that is, stored in the ROM (or FLASH or other non-volatile memory) of the receiver/decoder 13, or broadcast and downloaded into the RAM or FLASH memory of the receiver/decoder 13.

Applications are stored in memory locations in the receiver/decoder 13 and represented as resource files. The resource files comprise graphic object description unit files, variables block unit files, instruction sequence files, application files and data files, as described in more detail in the above-mentioned patent specifications.

The receiver/decoder contains memory divided into a RAM volume, a FLASH volume and a ROM volume, but this physical organization is distinct from the logical organization. The memory may further be divided into memory volumes associated with the various interfaces. From one point of view, the memory can be regarded as part of the hardware; from another point of view, the memory can be regarded as supporting or containing the whole of the system shown apart from the hardware.

The central processor 20 can be regarded as centred on a run time engine 4008 forming part of a virtual machine 4007. This is coupled to applications on one side (the "high level" side), and, on the other side (the "low level" side), via various intermediate logical units discussed below, to the receiver/decoder hardware 4061, comprising the various ports as discussed above (that is, for example, the serial interface 21, the parallel interface 22, modem 23, and control unit 26).

With specific reference to Figure 3, various applications 4057 are coupled to the

virtual machine 4007; some of the more commonly used applications may be more or less permanently resident in the system, as indicated at 4057, while others will be downloaded into the system, eg from the MPEG data stream or from other ports as required.

The virtual machine 4007 includes, in addition to the run time engine 4008, some resident library functions 4006 which include a toolbox 4058. The library contains miscellaneous functions in C language used by the engine 4008. These include data manipulation such as compression, expansion or comparison of data structures, line drawing, etc. The library 4006 also includes information about firmware in the receiver/decoder 13, such as hardware and software version numbers and available RAM space, and a function used when downloading a new device 4062. Functions can be downloaded into the library, being stored in FLASH or RAM memory.

The run time engine 4008 is coupled to a device manager 4068 which is coupled to a set of devices 4062 which are coupled to device drivers 4060 which are in turn coupled to the ports or interfaces. In broad terms, a device driver can be regarded as defining a logical interface, so that two different device drivers may be coupled to a common physical port. A device will normally be coupled to more than one device driver; if a device is coupled to a single device driver, the device will normally be designed to incorporate the full functionality required for communication, so that the need for a separate device driver is obviated. Certain devices may communicate among themselves.

As will be described below, there are 3 forms of communication from the devices 4064 up to the run time engine: by means of variables, buffers, and events which are passed to a set of event queues.

Each function of the receiver/decoder 13 is represented as a device 4062 in the software architecture of the receiver/decoder 13. Devices can be either local or

remote. Local devices 4064 include smartcards, SCART connector signals, modems, serial and parallel interfaces, a MPEG video and audio player and an MPEG section and table extractor. Remote devices 4066, executed in a remote location, differ from local devices in that a port and procedure must be defined by the system authority or designer, rather than by a device and device driver provided and designed by the receiver/decoder manufacturer.

The run time engine 4008 runs under the control of a microprocessor and a common application programming interface. They are installed in every receiver/decoder 13 so that all receiver/decoders 13 are identical from the application point of view.

The engine 4008 runs applications 4056 on the receiver/decoder 13. It executes interactive applications 4056 and receives events from outside the receiver/decoder 13, displays graphics and text, calls devices for services and uses functions of the library 4006 connected to the engine 4008 for specific computation.

The run time engine 4008 is an executable code installed in each receiver/decoder 13, and includes an interpreter for interpreting and running applications. The engine 4008 is adaptable to any operating system, including a single task operating system (such as MS-DOS). The engine 4008 is based on process sequencer units (which take various events such as a key press, to carry out various actions), and contains its own scheduler to manage event queues from the different hardware interfaces. It also handles the display of graphics and text. A process sequencer unit comprises a set of action-groups. Each event causes the process sequencer unit to move from its current action-group to another action-group in dependence on the character of the event, and to execute the actions of the new action-group.

The engine 4008 comprises a code loader to load and download applications 4056 into the receiver/decoder memory. Only the necessary code is loaded into the RAM or FLASH memory, in order to ensure optimal use. The downloaded data is verified

by an authentication mechanism to prevent any modification of an application 4056 or the execution of any unauthorized application. The engine 4008 further comprises a decompressor. As the application code (a form of intermediate code) is compressed for space saving and fast downloading from the MPEG stream or via a built-in receiver/decoder mode, the code must be decompressed before loading it into the RAM. The engine 4008 also comprises an interpreter to interpret the application code to update various variable values and determine status changes, and an error checker.

Before using the services of any device 4062, a program (such as an application instruction sequence) has to be declared as a "client", that is, a logical access-way to the device 4062 or the device manager 4068. The manager gives the client a client number which is referred to in all accesses to the device. A device 4062 can have several clients, the number of clients for each device 4062 being specified depending on the type of device 4062. A client is introduced to the device 4062 by a procedure "Device: Open Channel". This procedure assigns a client number to the client. A client can be taken out of the device manager 4068 client list by a procedure "Device: Close Channel".

The access to devices 4062 provided by the device manager 4068 can be either synchronous or asynchronous. For synchronous access, a procedure "Device: Call" is used. This is a means of accessing data which is immediately available or a functionality which does not involve waiting for the desired response. For asynchronous access, a procedure "Device: I/O" is used. This is a means of accessing data which involves waiting for a response, for example scanning tuner frequencies to find a multiplex or getting back a table from the MPEG stream. When the requested result is available, an event is put in the queue of the engine to signal its arrival. A further procedure "Device: Event" provides a means of managing unexpected events.

As noted above, the main loop of the run time engine is coupled to a variety of process sequencer units, and when the main loop encounters an appropriate event, control is temporarily transferred to one of the process sequencer units.

Thus, it can be seen that the central processor 20 provides a platform having considerable flexibility in enabling an application to communicate with a variety of devices.

In the case of received audio and video signals, the MPEG packets containing these signals will be demultiplexed and filtered so as to pass real time audio and video data in the form of a packetised elementary stream (PES) of audio and visual data to dedicated audio and video processors or decoders 33, 34. The converted output from the audio processor 33 passes to a preamplifier 35 and thereafter via the audio output of the receiver/decoder. The converted output from the video processor 34 passes via a graphic processor 36 and PAL/SECAM encoder 37 to the video output of the receiver/decoder.

With reference to Figure 2, the graphic processor 36 is preferably designed to generate a screen display combining moving images together with overlaid text or other images. More specifically it can combine 4 layers; a stills layer, a moving image layer, a graphics layer, and a cursor layer. As described in more detail below, the graphic processor 36 additionally receives graphic data for display (such as generated images etc) from the central processor 20 and combines this information with information received from the video processor 34 to generate the screen display.

As shown in more detail in Figure 4, the graphic processor 36 includes dedicated RAM memory area 40, dedicated microprocessor 41 and graphics library 42. With reference to Figure 5, the RAM memory area 40 of the graphic processor 36 is divided into a number of buffer areas; a stills layer buffer area 43, a moving image layer buffer area 44 and a graphics layer buffer area 45.

The stills layer is used for background images of a broadly static nature. The circuitry and software associated with the stills layer buffer area 43 can preferably generate an image therein by any desired combination of the following processes:

- generating and filling rectangles with specific colours (defined by up to 24 bits);
- copying images received from the MPEG data stream;
- repeating an image occupying less than the full screen area, to produce a wallpaper effect.

The moving image layer is used for the incoming video signals obtained from the MPEG data stream. The circuitry and software associated with the moving image layer buffer area 44 can preferably resize and scale the incoming images, and combine images from a plurality of sources into different areas of the buffer area.

The graphics layer is used to produce titles and icons (graphics). Titles are frequently subtitles, which appear centred near the lower edge of the image, but may also appear in other positions on the image. Icons are generally geometric shapes such as rectangles, circles, buttons, and dialogue boxes (it will be realized that the term "icon" is here being used in a broad sense).

The graphics layer is defined by one or more rectangular regions, each rectangular region being defined by the coordinates of the upper left corner of the region and the size of the region. Accordingly, the graphics layer buffer area 45 is sub-divided into a plurality of buffer regions 45A, 45B, ... 45N, one buffer region for each of the rectangular regions of the graphics layer. Each buffer region 45A... comprises a plurality of sub-areas $45A^0$, $45A^1$...$45A^n$. Each buffer region is created by a "subtitle" device 4062, under the control of an application 4056, in the central processor 20 using a command procedure stored in the graphics library 42.

With reference to Figure 6, the contents of the stills layer buffer area 43 and the

moving image layer buffer area 44, as they are read out, are mixed together by a mixing circuit 50 which can be set to blend (alpha blending, that is, translucently) those outputs; and the output of that mixing circuit 50 is combined with the contents of the graphics layer buffer area 45, as those contents are read out, by a similar mixing circuit 51.

The output of that mixing circuit is combined with the output of a hardware cursor generator 52 by a combining circuit 53 which superposes a cursor signal on the combination of the first 3 layers. The cursor layer is preferably superposed opaquely, that is, without the option of blending, on the combination of the first 3 layers, so that the combination of the first 3 layers is wholly obscured within the area of the cursor. However, one of the bit values available for the cursor pixels is preferably "transparent", so that the cursor can effectively have "holes" in it through which the underlying combined image from the first 3 layers can be seen.

This 4-layer structure produces potential problems with respect to the third layer, that is, the graphics layer. These problems arise because two separate types of display element, titles and icons, are being generated in the same layer. There is therefore the possibility of conflict between these two types of display element. For example, it will often be desirable to change the titles and the icons at different times (and often it will be desirable for the icons to remain in place for longer than the titles). As noted above, the fact that titles may appear in any position on the display, rather than solely in the standard subtitle position, means that such possibility of conflict is substantial.

To overcome this problem, each buffer region 45A, 45B... includes two buffer sub-areas $45A^0$ and $45A^1$ which are reserved for use by the subtitle device 4062 to build and display subtitles.

The subtitle device 4062 in the central processor 20 selects which of the two buffer

sub-areas $45A^0$ and $45A^1$ is to be used to receive incoming data for display and outputs an appropriate command to the graphic processor 36. In turn, the microprocessor 41 of the graphic processor 36 directs incoming data to the selected buffer sub-area. For this purpose, the two buffer sub-areas $45A^0$ and $45A^1$ are treated as a "working buffer" and a "display buffer". The sub-area into which currently incoming data is fed is the working buffer, so its contents will be changing.

The received data (subtitles) is directed into the two buffers sub-areas $45A^0$ and $45A^1$ alternately. In other words, the subtitle device 4062 reverses the roles of the two sub-areas each time the working buffer has a new complete subtitle page to display, as the contents of that sub-area are no longer changing, giving a steady image which is acceptable to the viewer so that sub-area can be used as the display buffer. The contents of the display buffer are read out as the graphics layer for combination with the combined stills layer and moving image layer. The interval between the interchange of the roles of the two sub-areas $45A^0$ and $45A^1$, that is, between the interchange of the working and display buffers, is typically 5 to 10 s. At that point, the subtitle device 4062 in the central processor 20 outputs an appropriate command to the graphic processor 36 to interchange the roles of the two sub-areas $45A^0$ and $45A^1$, and, in turn, the microprocessor 41 of the graphic processor 36 clears the contents of the other sub-area and directs incoming data to that sub-area.

Each buffer region 45A, 45B... includes a further buffer area, namely an icon buffer area $45A^i$, $45B^i$...., as shown in Figure 5. Each icon buffer area $45A^i$ comprises one or more icon buffer sub-areas, $45A^2$, $45A^3$... up to $45A^{15}$. Each icon buffer sub-area contains respective icon image data. The icon image may be generated by software stored in the central processor 20, stored in the RAM area 20A (or FLASH memory area) of the central processor 20 and copied by the central processor 20 into a designated icon buffer sub-area of the RAM area 41 of the graphic processor 36. Once an icon image has been stored in the graphic processor 36, it remains in its buffer sub-area and can be copied repeatedly to either of the two buffer sub-areas

$45A^0$ and $45A^1$ whenever required. In this way, a whole series of icon images can be constructed, which can be used in whatever sequences and at whatever times are required.

The combination of the two images, the subtitles image in one or other of the buffer sub-areas $45A^0$ and $45A^1$ and the icon image in the icon buffer area $45A^i$, is achieved by copying the icon image into the working buffer, that is, into whichever of the two sub-areas $45A^0$ and $45A^1$ is not currently the display buffer. As specified by the controlling application, the subtitle device 4062 outputs an appropriate command to the graphic processor 36 to copy the contents of a specified icon buffer sub-area to the working buffer just before the working buffer is to become the display buffer, that is, when a complete subtitle page has been stored in the working buffer.

With the above arrangement, the icon image currently being displayed is stored in the display buffer, the next icon image to be displayed may already be stored in the working buffer, and a fresh icon image may be under construction by the icon generator while the working buffer is receiving subtitles data. This arrangement requires synchronism between the interchanging of the working and adjacent play buffers and the construction of fresh icon images.

At any time, the application controlling the subtitle device 4062 may require the currently displayed icon image to be changed without alteration of the displayed subtitle, for example, upon input of a command from the remote control 25. In this case, the subtitle device 4062 outputs a command to the graphic processor 36 to copy an icon image stored in the icon buffer area immediately into the display buffer over the icon image already stored therein.

In summary, when a subtitle screen has been fully received in the data buffer area, a central processing unit in the receiver/decoder, under the control of a device, passes

icon data into the data buffer area, preferably just before the data stored in the data buffer area is combined with other data to provide video data. Hence, in the event of an overlap between the icon and part of the subtitle, the icon can be laid over that part of the subtitle, but the non-overlapped parts can be concurrently displayed with the icon.

The precise details of the implementation of the various functions described above, and their distribution between hardware and software, are a matter of choice for the implementor and will not be described in detail. It is, however, noted that dedicated integrated circuits capable of performing the operations required in the receiver/decoder are commercially available or can be readily designed, and these can be used as the basis for a hardware accelerator, or more preferably modified to produce a dedicated hardware accelerator, to implement various of the operations required, thereby reducing the processing power required to run the software. However, the operations required may be implemented in software if sufficient processing power is available.

The modules and other components have been described in terms of the features and functions provided by each component, together with optional and preferable features. With the information given and specifications provided, actual implementation of these features and the precise details are left to the implementor. As an example, certain modules could be implemented in software, preferably written in the C programming language and preferably compiled to run on the processor used to run the application; however, some components may be run on a separate processor, and some or all components may be implemented by dedicated hardware.

The above modules and components are merely illustrative, and the invention may be implemented in a variety of ways, and, in particular, some components may be combined with others which perform similar functions, or some may be omitted in simplified implementations. Hardware and software implementations of each of the

functions may be freely mixed, both between components and within a single component.

It will be readily understood that the functions performed by the hardware, the computer software, and such like are performed on or using electrical and like signals. Software implementations may be stored in ROM, or may be patched in FLASH.

It will be understood that the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention. Each feature disclosed in the description, and (where appropriate) the claims and drawings may be provided independently or in any appropriate combination.

CLAIMS

1. A method of processing video data in a receiver/decoder comprising at least one port for receiving data and memory means comprising a data buffer area for storing incoming data for display, and a graphics buffer area for storing graphics data, said method comprising passing graphics data stored in the graphics buffer area to the data buffer area for combination with display data stored therein.

2. A method according to Claim 1, wherein the data buffer area comprises two data buffer sub-areas, said incoming display data being directed into one of said sub-areas at a time.

3. A method according to Claim 2, wherein the two sub-areas are interchanged so that further incoming display data is stored in the other sub-area and graphics data stored in the graphics buffer area is passed to the other sub-area.

4. A method according to Claim 3, wherein the two sub-areas are interchanged immediately after graphics data stored in the graphics buffer area is passed to one of the data buffer sub-areas.

5. A method according to any preceding claim, wherein the graphics buffer area comprises a plurality of graphics buffer sub-areas in which graphics data is stored, graphics data being passed to the data buffer area from a selected one of the graphics buffer sub-areas.

6. A method according to any preceding claim, wherein the combined graphics and display data is further combined with other received data to provide video data.

7. A method according to Claim 6, wherein graphics data stored in the graphics buffer area is passed into the data buffer area for combination with display data stored

therein immediately before the thus combined graphics and display data is combined with said other received data.

8. A method according to any preceding claim, wherein the video data comprises four layers of data, said combined graphics and display data comprising one of said layers.

9. A method according to Claim 8, wherein the four layers of data comprise said combined graphics and display data layer, a stills data layer, a moving image data layer, and a cursor data layer.

10. A method according to Claim 9, wherein the moving image data layer and the display data comprise at least part of an MPEG datastream.

11. A receiver/decoder comprising at least one port for receiving data, memory means comprising a data buffer area for storing incoming data for display and a graphics buffer area for storing graphics data, and means for passing graphics data stored in the graphics buffer area to the data buffer area for combination with display data stored therein.

12. A receiver/decoder according to Claim 11, wherein said data buffer area comprises two data buffer sub-areas, and the receiver/decoder further comprises means for directing incoming data into one of said sub-areas.

13. A receiver/decoder according to Claim 12, further comprising control means, the directing means being arranged to direct incoming display data to one of the data buffer sub-areas as specified by said control means.

14. A receiver/decoder according to Claim 12 or 13, further comprising means for interchanging the two sub-areas so that further incoming display data is storable in

the other sub-area and graphics data stored in the graphics buffer area is passable to the other sub-area.

15. A receiver/decoder according to Claim 14, wherein the interchanging means is adapted to interchange the two data buffer sub-areas immediately after graphics data stored in the graphics buffer area is passed to one of the data buffer sub-areas.

16. A receiver/decoder according to any of Claims 11 to 15, wherein the graphics buffer area comprises a plurality of graphics buffer sub-areas in which graphics data is storable, graphics data being passable to the data buffer area from a selected one of the graphics buffer sub-areas.

17. A receiver/decoder according to any of Claims 11 to 16, further comprising means for combining the combined graphics and display data with other received data to provide video data.

18. A receiver/decoder according to Claim 17, wherein the passing means is arranged to pass graphics data stored in the graphics buffer area into the data buffer area for combination with display data stored therein immediately before combining means combines the combined graphics and display data with said other received data.

19. A broadcast and reception system including a receiver/decoder according to any of Claims 11 to 18, and means for broadcasting said data.

20. A method of processing video data in a receiver/decoder substantially as herein described with reference to the accompanying drawings.

21. A receiver/decoder substantially as herein described with refernce to the accompanying drawings.

22. A broadcast and reception system substantially as herein described with reference to the accompanying drawings.

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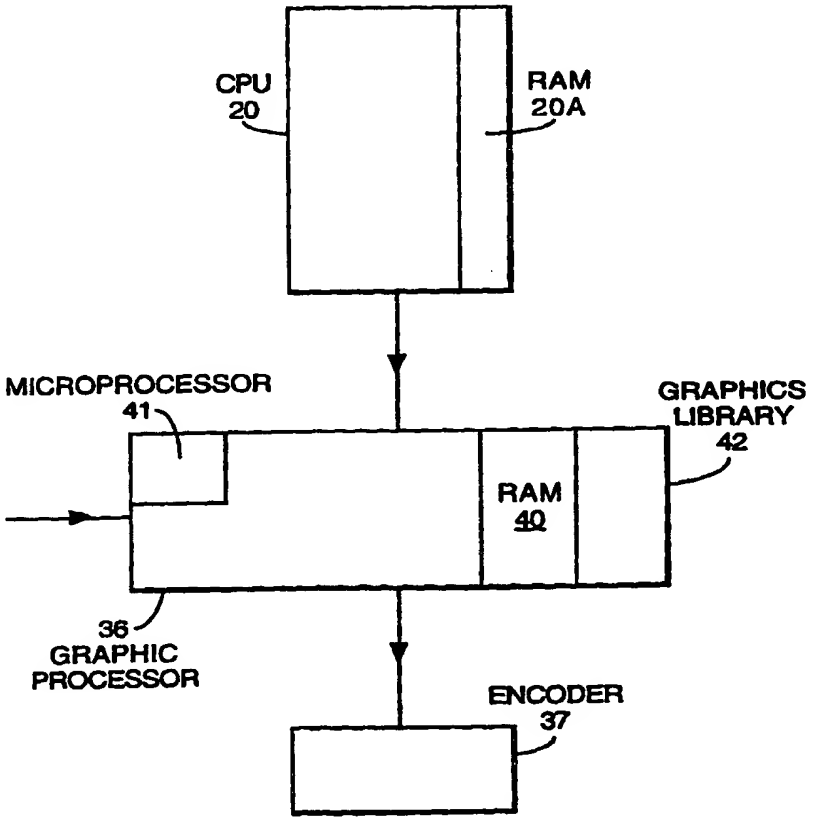
(57) Abstract

A method of processing video data in a receiver/decoder comprising at least one port (31) for receiving data and memory means (40) comprising a data buffer area ($45A^0$, $45A^1$) for storing incoming data for display, and a graphics buffer area ($45A^i$) for storing graphics data, said method comprising passing graphics data stored in the graphics buffer area to the data buffer area for combination with display data stored therein.



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INTERNATIONAL SEARCH REPORT

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PCT/IB 99/00850

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N5/445 G09G1/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G09G H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 559 549 A (BONNER ALFRED E ET AL) 24 September 1996 (1996-09-24) column 6, line 23 - line 26	1,5-11, 16-22
A	column 8, line 15 - line 16 column 10, line 48 - column 11, line 34 column 13, line 1 - line 7 column 18, line 11 - line 27 column 18, line 48 - column 19, line 47 column 24, line 7 - column 26, line 7 figures 9A,B,C	2-4, 12-15

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 September 1999	15/09/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	La, V

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00850

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	EP 0 752 695 A (SUN MICROSYSTEMS INC) 8 January 1997 (1997-01-08) page 2, line 3 - line 25 page 3, line 4 - line 29 page 5, line 28 - line 54 page 6, line 47 - page 7, line 4 abstract; figure 2	1,5,11, 16,19-22 2-4, 12-15 6-10,17, 18
Y A	US 4 862 154 A (GONZALEZ-LOPEZ JORGE) 29 August 1989 (1989-08-29) column 1, line 7 - line 12 column 2, line 46 - line 55 column 3, line 1 - line 9 column 4, line 15 - line 29 abstract; figure 7	2-4, 12-15 1,5-11, 16-22
X A	EP 0 575 149 A (HONEYWELL INC) 22 December 1993 (1993-12-22) column 1, line 28 - line 33 column 2, line 57 - column 3, line 59 column 6, line 22 - line 33 abstract; figure 3	1,11, 19-22 2-10, 12-18
A	EP 0 802 519 A (SEIKO EPSON CORP) 22 October 1997 (1997-10-22) page 2, line 20 - line 21 page 4, line 45 - line 56 page 6, line 31 - line 33 page 12, line 17 - page 15, line 29 page 16, line 13 - line 21 abstract; figures 20,21	1-22
A	US 5 594 467 A (MARLTON ANTHONY P ET AL) 14 January 1997 (1997-01-14) column 1, line 56 - line 67 column 3, line 22 - line 28 column 3, line 53 - column 4, line 16 column 25, line 21 - line 57 abstract	1-22
A	EP 0 384 257 A (IBM) 29 August 1990 (1990-08-29) column 1, line 4 - line 13 column 1, line 53 - column 2, line 6 column 3, line 24 - line 30 column 5, line 34 - column 7, line 20 column 14, line 8 - line 13 abstract; figures 1-3	1-22

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00850

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 484 981 A (FUJI PHOTO FILM CO LTD) 13 May 1992 (1992-05-13) column 1, line 5 - line 10 column 5, line 30 - column 6, line 36 column 21, line 38 - column 23, line 47 column 24, line 4 - line 5 column 28, line 40 - column 29, line 37 abstract; figures 1,2	1-22
A	EP 0 766 463 A (TOKYO SHIBAURA ELECTRIC CO) 2 April 1997 (1997-04-02) abstract	1-22

INTERNATIONAL SEARCH REPORT

nformation on patent family members

International Application No
PC./IB 99/00850

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5559549 A	24-09-1996	AT 177277 T	15-03-1999
		AT 176840 T	15-03-1999
		AT 183352 T	15-08-1999
		AT 176841 T	15-03-1999
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		AU 693775 B	09-07-1998
		AU 5732994 A	04-07-1994
		AU 692427 B	11-06-1998
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		CN 1090454 A	03-08-1994
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		DE 69323562 D	25-03-1999
		DE 69323767 D	08-04-1999
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Information on patent family members

International Application No
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Name and mailing address of the ISA	Authorized officer
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 0 766 463 A (TOKYO SHIBAURA ELECTRIC CO) 2 April 1997 (1997-04-02) abstract	1-22

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International Application No
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		CN 1090452 A	03-08-1994
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		EP 0852442 A	08-07-1998
		EP 0849948 A	24-06-1998
		EP 0862328 A	02-09-1998
		EP 0856993 A	05-08-1998
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EP 0752695 A	08-01-1997	US 5896140 A	20-04-1999
		JP 9237073 A	09-09-1997
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		DE 3750211 T	02-02-1995
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		JP 10049125 A	20-02-1998
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		JP 2248993 A	04-10-1990
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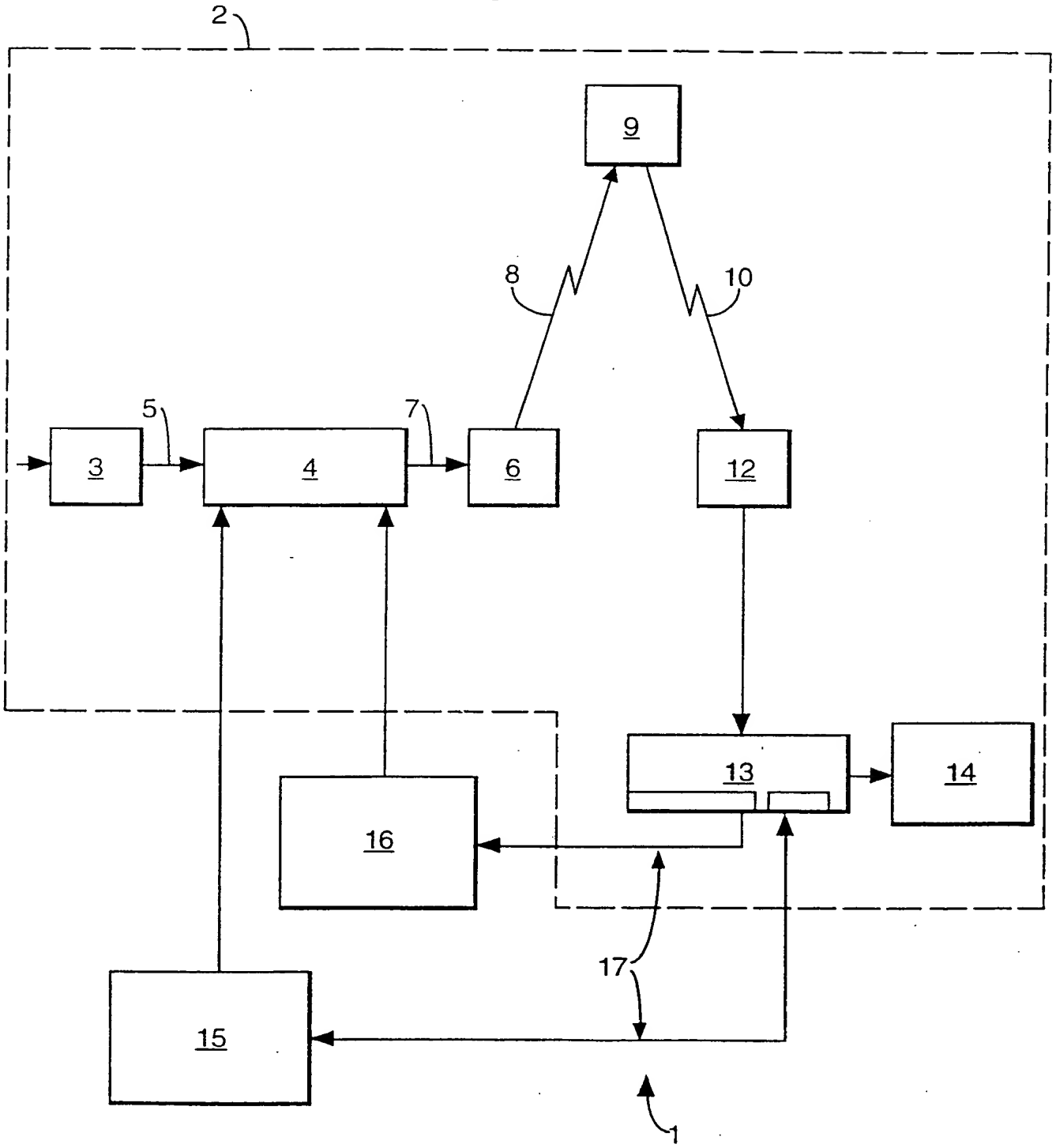
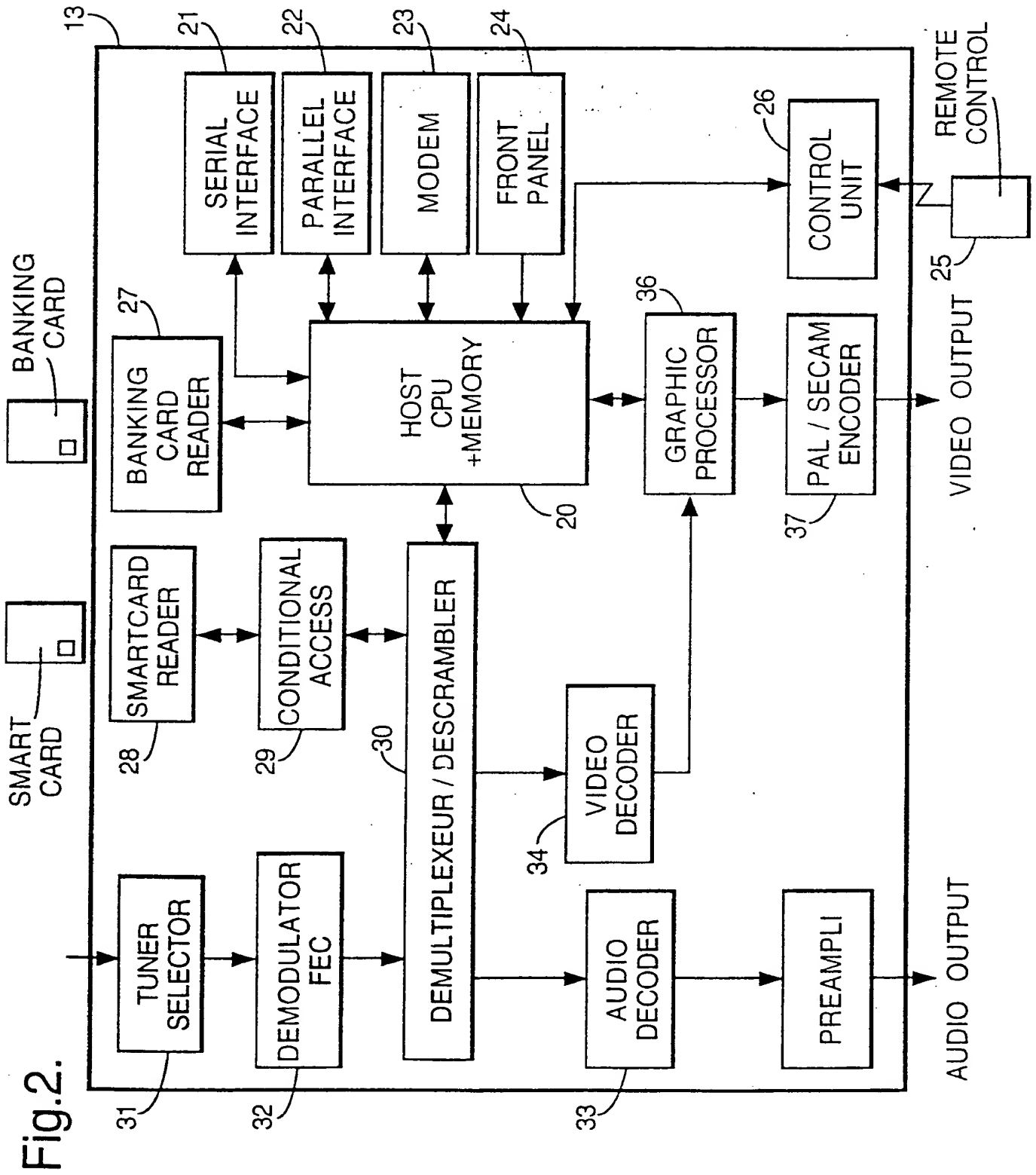
		US 5426731 A	20-06-1995
		US 5327156 A	05-07-1994
EP 0766463 A	02-04-1997	JP 9093548 A	04-04-1997
		CN 1152839 A	25-06-1997
		US 5734436 A	31-03-1998

Fig.1.

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SERIAL INTERFACE
PARALLEL INTERFACE
MODEM
FRONT PANEL
26
CONTROL UNIT
REMOTE CONTROL
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BANKING CARD
27
BANKING CARD READER
HOST CPU +MEMORY
20
36
GRAPHIC PROCESSOR
PAL / SECAM ENCODER
37
VIDEO OUTPUT
SMART CARD
28
SMARTCARD READER
29
CONDITIONAL ACCESS
30
DEMULTIPLEXEUR / DESCRAMBLER
34
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AUDIO OUTPUT

Fig.2.

Fig.3.

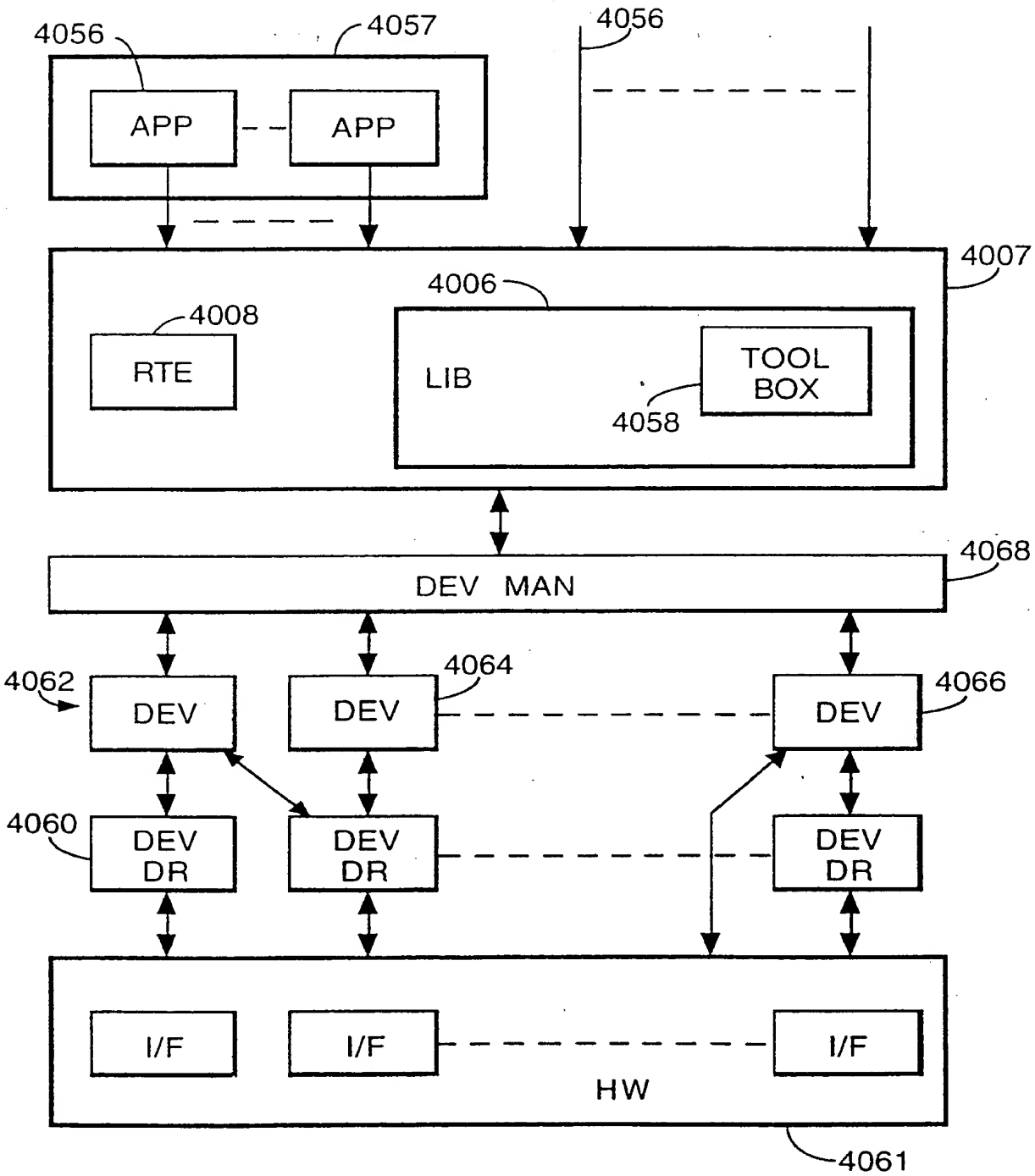
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Fig.4.

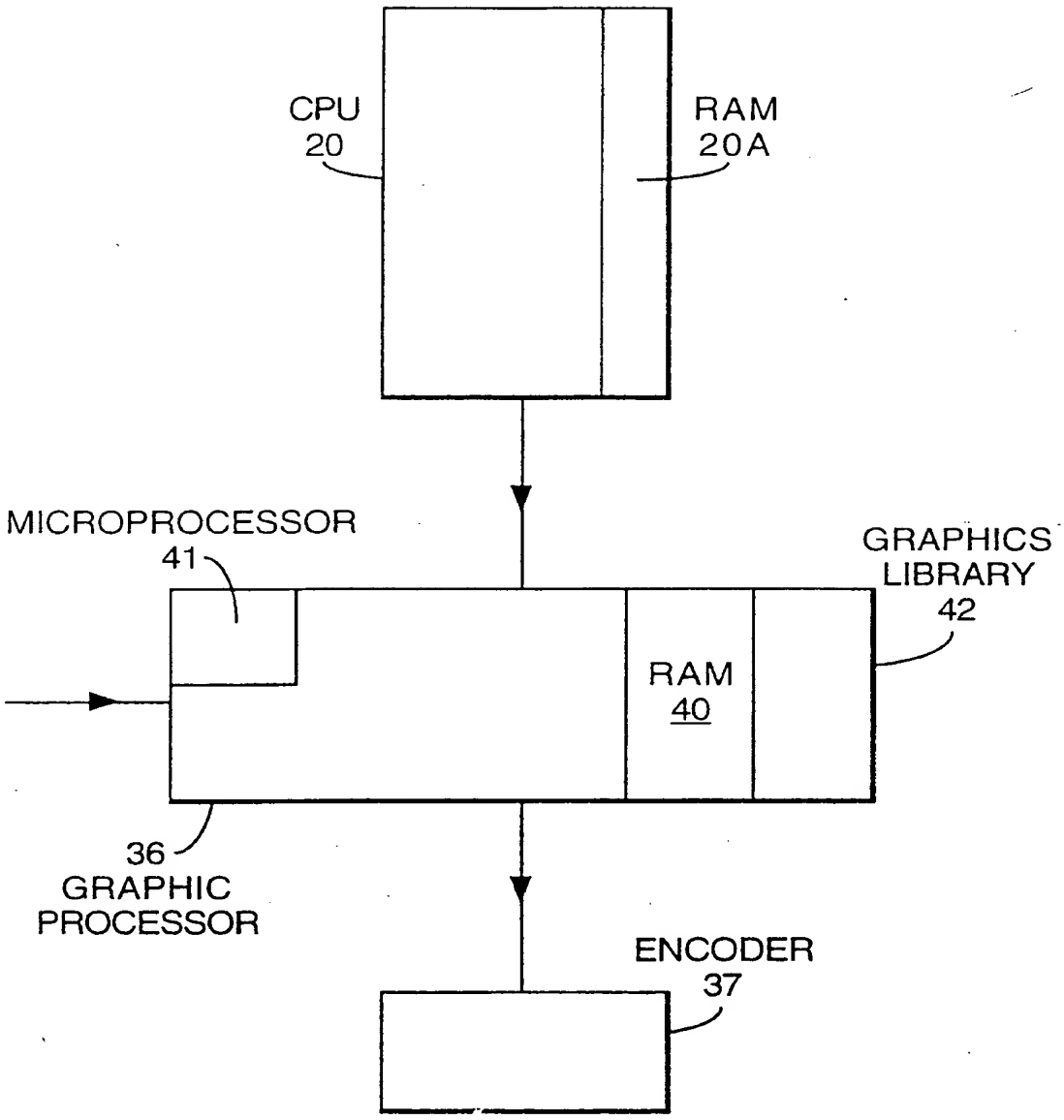
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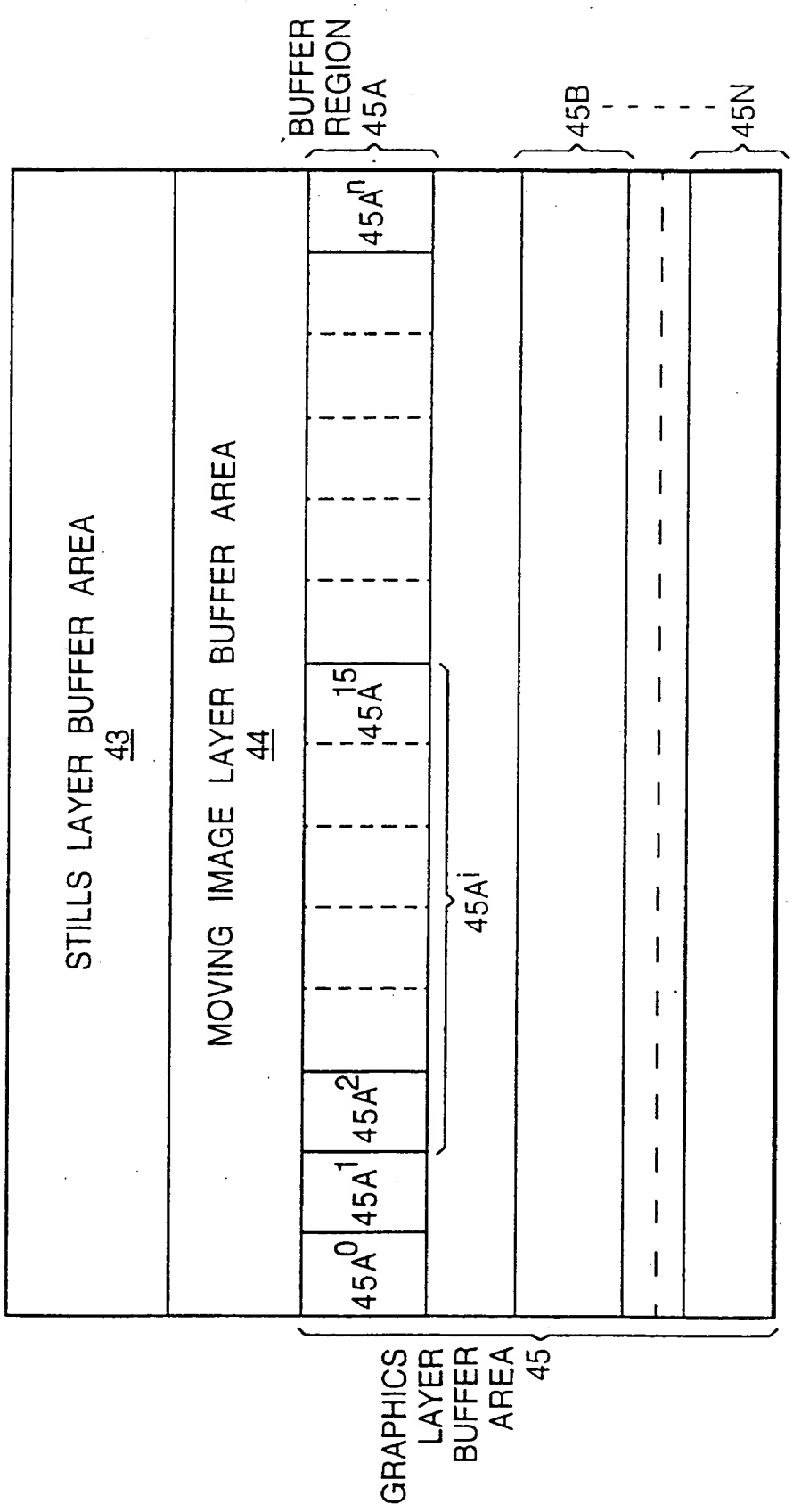
Fig.5.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43
MOVING IMAGE LAYER BUFFER AREA
44
BUFFER REGION
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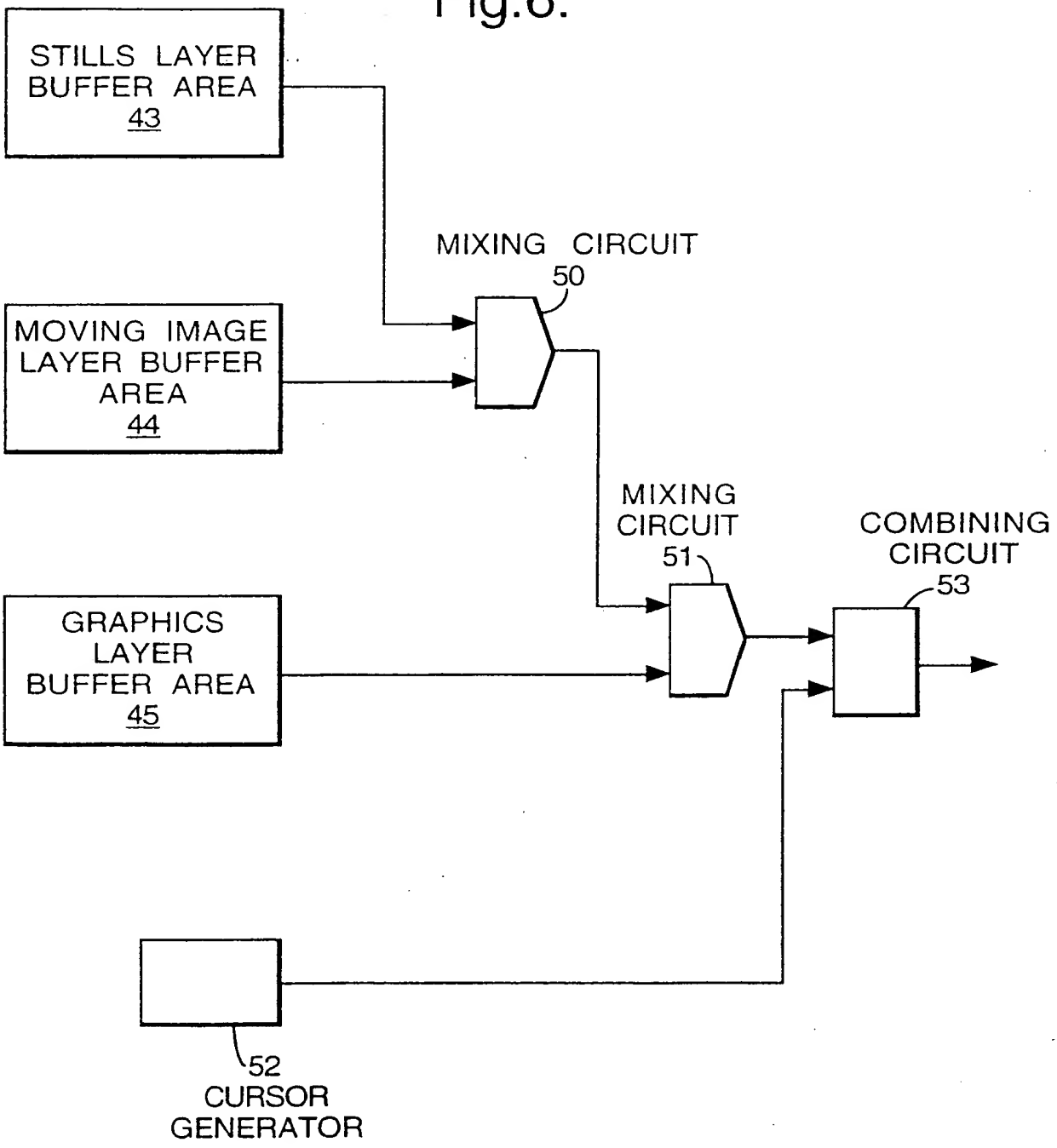
45B
45N
45A0
45A1
45A2
45A15
45An
45Ai
GRAPHICS LAYER BUFFER AREA
45

Fig.6.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MOVING IMAGE LAYER BUFFER AREA 44
GRAPHICS LAYER BUFFER AREA 45
MIXING CIRCUIT 50
MIXING CIRCUIT 51
COMBINING CIRCUIT 53
52 CURSOR GENERATOR

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
PDC/AB/20402		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/IB 99/00850	29/04/1999	29/04/1998
Applicant		
CANAL+ SOCIETE ANONYME et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 4

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

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-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 September 1999	15/09/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	La, V

1

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X Y A	EP 0 752 695 A (SUN MICROSYSTEMS INC) 8 January 1997 (1997-01-08) page 2, line 3 - line 25 page 3, line 4 - line 29 page 5, line 28 - line 54 page 6, line 47 - page 7, line 4 abstract; figure 2	1,5,11, 16,19-22 2-4, 12-15 6-10,17, 18
Y A	US 4 862 154 A (GONZALEZ-LOPEZ JORGE) 29 August 1989 (1989-08-29) column 1, line 7 - line 12 column 2, line 46 - line 55 column 3, line 1 - line 9 column 4, line 15 - line 29 abstract; figure 7	2-4, 12-15 1,5-11, 16-22
X A	EP 0 575 149 A (HONEYWELL INC) 22 December 1993 (1993-12-22) column 1, line 28 - line 33 column 2, line 57 - column 3, line 59 column 6, line 22 - line 33 abstract; figure 3	1,11, 19-22 2-10, 12-18
A	EP 0 802 519 A (SEIKO EPSON CORP) 22 October 1997 (1997-10-22) page 2, line 20 - line 21 page 4, line 45 - line 56 page 6, line 31 - line 33 page 12, line 17 - page 15, line 29 page 16, line 13 - line 21 abstract; figures 20,21	1-22
A	US 5 594 467 A (MARLTON ANTHONY P ET AL) 14 January 1997 (1997-01-14) column 1, line 56 - line 67 column 3, line 22 - line 28 column 3, line 53 - column 4, line 16 column 25, line 21 - line 57 abstract	1-22
A	EP 0 384 257 A (IBM) 29 August 1990 (1990-08-29) column 1, line 4 - line 13 column 1, line 53 - column 2, line 6 column 3, line 24 - line 30 column 5, line 34 - column 7, line 20 column 14, line 8 - line 13 abstract; figures 1-3	1-22

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 484 981 A (FUJI PHOTO FILM CO LTD) 13 May 1992 (1992-05-13) column 1, line 5 - line 10 column 5, line 30 - column 6, line 36 column 21, line 38 - column 23, line 47 column 24, line 4 - line 5 column 28, line 40 - column 29, line 37 abstract; figures 1,2 ---	1-22
A	EP 0 766 463 A (TOKYO SHIBAURA ELECTRIC CO) 2 April 1997 (1997-04-02) abstract -----	1-22

INTERNATIONAL SEARCH REPORT

mation on patent family members

ernational Application No
PCT/IB 99/00850

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5559549 A	24-09-1996	AT 177277 T	15-03-1999
		AT 176840 T	15-03-1999
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		AT 176841 T	15-03-1999
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		EP 0862328 A	02-09-1998
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		JP 9237073 A	09-09-1997
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		CN 1152839 A	25-06-1997
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A.D

17

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PDC/AB/20402		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB99/00850	29/04/1999	29/04/1998
International Patent Classification (IPC) or national classification and IPC H04N5/445		
Applicant CANAL+ SOCIETE ANONYME et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
04/11/1999	20.01.2000
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Glendinning, D Telephone No. +49 89 2399 2443

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB99/00850

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-20 as originally filed

Claims, No.:

1-22 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 20,21,22.

because:

☒ the said international application, or the said claims Nos. 20,21,22 relate to the following subject matter which does not require an international preliminary examination (*specify*):

see separate sheet

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-19
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-19
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

III Non-establishment of report

No report has been established in respect of claims 20, 21 and 22 since these claims are in a form not permissible under the PCT (see section VII below).

V Reasoned statement under Article 35(2)

Independent claims 1 and 11 define a method and apparatus employing a memory having a data buffer area for storing incoming data for display and a graphics buffer area for storing graphics data, wherein graphics data is transferred from the graphics buffer area to the data buffer area for combination with the display data stored therein. All of the documents cited in the Search Report, including the documents cited in the X and Y categories, appear to relate to systems including separate buffers or memories for incoming data and graphics, information being read from the respective buffers or memories at appropriate times for onward feeding to a display. No combination of the cited documents would appear to suggest storing incoming data and graphics data in separate buffers of a memory and then transferring graphics data from one buffer to the other for combination with the display data. The claimed subject matter thus appears to be new and to have inventive step.

VII Certain defects in the international application

Claims 20, 21 and 22 are in a form not permitted by Rule 6.2(a) PCT and should accordingly be deleted.

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 24 November 1999 (24.11.99)	
International application No. PCT/IB99/00850	**Applicant's or agent's file reference** PDC/AB/20402
International filing date (day/month/year) 29 April 1999 (29.04.99)	**Priority date** (day/month/year) 29 April 1998 (29.04.98)
Applicant MERIC, Jérome et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

04 November 1999 (04.11.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

C. Carrié

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION RELATING TO PRIORITY CLAIM

(PCT Rules 26bis.1 and 26bis.2 and Administrative Instructions, Sections 402 and 409)

To:

COZENS, Paul, Dennis
Mathys & Squire
100 Gray's Inn Road
London WCIX 8AL
ROYAUME-UNI

Date of mailing (day/month/year) 17 June 1999 (17.06.99)	
Applicant's or agent's file reference PDC/AB/20402	**IMPORTANT NOTIFICATION**
International application No. PCT/IB99/00850	International filing date (day/month/year) 29 April 1999 (29.04.99)
Applicant CANAL+ SOCIETE ANONYME et al	

The applicant is hereby **notified** of the following in respect of the priority claim(s) made in the international application.

1. [X] **Correction of priority claim.** In accordance with the applicant's notice received on: 04 June 1999 (04.06.99), the following priority claim has been corrected to read as follows:

EP 29 April 1998 (29.04.98) 98401075.1

- [ ] even though the indication of the number of the earlier application is missing.
- [ ] even though the following indication in the priority claim is not the same as the corresponding indication appearing in the priority document:

2. [ ] **Addition of priority claim.** In accordance with the applicant's notice received on: , the following priority claim has been added:

- [ ] even though the indication of the number of the earlier application is missing.
- [ ] even though the following indication in the priority claim is not the same as the corresponding indication appearing in the priority document:

3. [ ] As a **result of the correction and/or addition** of (a) priority claim(s) under items 1 and/or 2, the (earliest) priority date is:

4. [ ] **Priority claim considered not to have been made.**

- [ ] The applicant failed to respond to the Invitation under Rule 26bis.2(a) (Form PCT/IB/316) within the prescribed time limit.
- [ ] The applicant's notice was received after the expiration of the prescribed time limit under Rule 26bis.1(a).
- [ ] The applicant's notice failed to correct the priority claim so as to comply with the requirements of Rule 4.10.

The applicant may, before the technical preparations for international publication have been completed and subject to the payment of a fee, request the International Bureau to publish, together with the international application, information concerning the priority claim. See Rule 26bis.2(c) and the PCT Applicant's Guide, Volume I, Annex B2(IB).

5. [ ] In case where **multiple priorities** have been claimed, the above item(s) relate to the following priority claim(s):

6. A copy of this notification has been sent to the receiving Office and

- [X] to the International Searching Authority (where the international search report has not yet been issued).
- [X] the designated Offices (which have already been notified of the receipt of the record copy).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Dominique DELMAS

Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:
MATHYS & SQUIRE
Attn. COZENS, P.
100 Gray's Inn Road
London WC1X 8AL
UNITED KINGDOM

17
Rec'd
Vol - Amend
- RDP. OA - 15/10

15/11/99

Applicant's or agent's file reference PDC/AB/20402	Date of mailing *(day/month/year)* 15/09/1999
	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/IB 99/00850	International filing date *(day/month/year)* 29/04/1999
Applicant CANAL+ SOCIETE ANONYME et al.	

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Jolanda Offerman-Hazeleger

Form PCT/ISA/220 (July 1998)

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international pbulication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped),whether

(i) the claim is unchanged;

(ii) the claim is cancelled;

(iii) the claim is new;

(iv) the claim replaces one or more claims as filed;

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international appplication is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.